

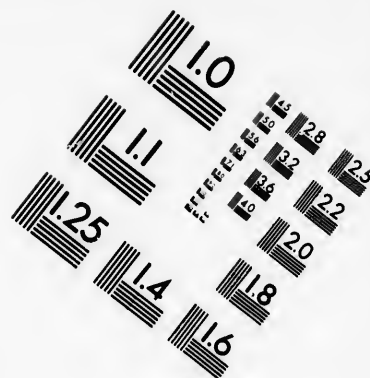
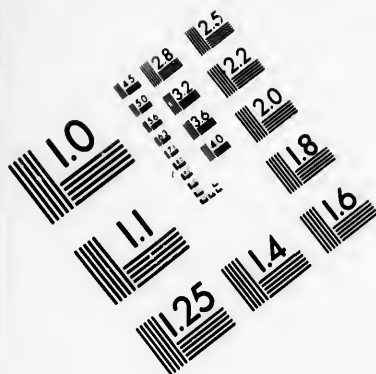
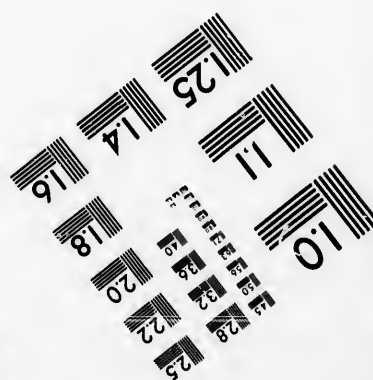
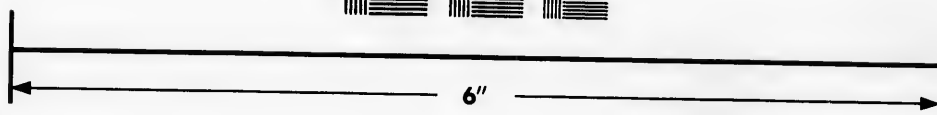
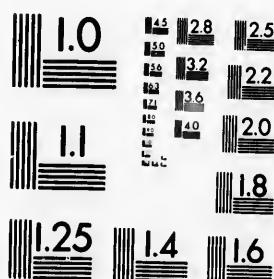


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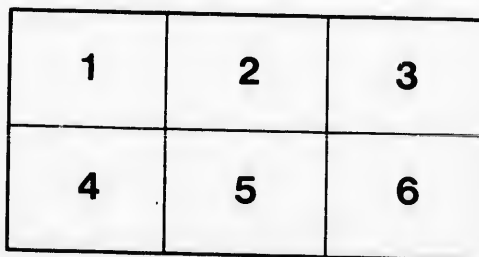
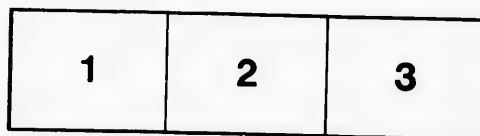
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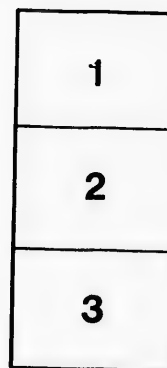
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No. 3.

THE
HARBOUR AND DOCK WORKS,
QUEBEC.

PUBLISHED BY AUTHORITY OF THE COMMISSIONERS.

No. 3.

THE
HARBOUR AND DOCK WORKS,
QUEBEC.

PUBLISHED BY AUTHORITY OF THE COMMISSIONERS.

PREFACE.

THIS third Annual Report on the Harbour Works, Quebec, contains a short preliminary statement of the ceremony of laying the tablet stone with the name "Louise" graven thereon, in commemoration of the gracious consent of Her Royal Highness the Princess Louise, to the works in progress being styled "THE PRINCESS LOUISE EMBANKMENT AND DOCKS."

Quebec, 1881.

THE HARBOUR AND DOCK WORKS, QUEBEC.

Published by authority of the Commissioners.

The progress made with our Harbour Improvements, year by year, forms part of the history of our times, so far, at least, as the annals of this most ancient city of Quebec are concerned.

For this reason, among others, we have recorded an annual summary of work done, the course thus taken having already proved a wise one,—by inviting attention throughout the wide domain of our commercial relationships over the globe to the extensive provision we are making, for the accommodation of shipping, and our future prospects in connection therewith.

The past year has been the season of patronage and honour as well as of the greatest progress. The first stone of the Graving Dock having been laid on Monday, the 7th June, by His Excellency the Governor-General, and the tablet stone with the name "Louise" graven on it, on Thursday, the 29th of July; thenceforth naming the Harbour Works in the River St. Charles, "The Princess Louise Embankment and Docks," and the Work in progress on the Levis or South side of the St. Lawrence, "The Lorne Graving Dock," thus, naming the entrance approaches to our cliff-bound City after our present popular Vice-regal rulers.

The 29th of July, 1880, was, however, the gala day with these works, the day's ceremony having been fully describ-

ed in the columns of the *Morning Chronicle*, on July 30th, when Mr. Verret, Secretary of the Commission, read the following address :—

May it please your Excellency and your Royal Highness Princess Louise :

We are assembled to-day to commemorate the gracious permission accorded by Her Royal Highness the Princess Louise to associate her name with the Works now in progress in the Harbour of Quebec, in having consented to their being named "The Princess Louise Embankment and Docks," by placing in position a Tablet Stone under the coping of the first section of the Harbour Wall, with the name "Louise" engraven thereon.

The important works thus named are expected on completion to promote the prosperity and welfare of all classes of the community in this city and province, by facilitating our ever-increasing import and export trade.

The provision thus made for the accommodation of shipping will be so complete that we shall be able also successfully to compete for a large share of the grain produce of the West.

These desirable results are fast approaching, and their realization will be in no small measure due to the encouragement, patronage and royal favour which we have this day come together to record.

Thanking your Excellency and your Royal Highness, we have the honour to subscribe ourselves on behalf of the Harbour Commissioners of Quebec.

Your most obedient Servants,

(Signed,)

P. V. VALIN,

Chairman.

(Signed,)

A. H. VERRET,

Secretary-Treasurer.

Quebec, 29th July, 1880.

To which His Excellency replied as follows:

*To the President and Board of Harbour Commissioners,
Quebec:*

MR. PRESIDENT AND GENTLEMEN OF THE BOARD OF THE QUEBEC HARBOUR COMMISSIONERS,—It is with a full sympathy for you in the hopes which have guided you to the construction of this great work, that the Princess comes to-day to lay this stone, commemorating an important stage in the completion of your labors. She desires that her name, graven on this wall, shall serve to remind your citizens as well as all who profit by the excellence of the accommodation here given to vessels of great burden, of her interest in your fortunes, and of her association with you in the speeding of its accomplishment, an undertaking designed to benefit at once a great port of the new world and many of the communities of Europe.

Access to Quebec is easy now to the largest ocean-going vessels. Your city has the railways far advanced, which will pierce to the heart of the granary of the world,—the great wheat centres of the Canadian North-West. The very might and grandeur of the stream on which Quebec is built is in her favour as compared with other centres of commerce, for her visitors have but little tax to pay when a favouring wind fails them and steam must be employed against the strong currents of the river.

The gigantic quays and the feeding lines of rail stretching inwards unbroken to the prairies, must in all human probability, in the future, ensure to the ancient capital a place among the most flourishing cities of the continent. Even without the aid which science is now bringing to her support, look at the strides which have been made in her prosperity within the last century. Old pictures will show you the hillside above us bare of all but the houses necessary for the garrison of a fortress, whose hard fate it had

been to be the place of contention of rival armies, while beneath the ramparts or within their walls were to be seen only a few of the buildings now devoted in far greater numbers to the purposes of religion and of charity. The banks of the St. Charles possessed then only a few store-houses such as would not now be thought sufficient for one of our fifth-rate towns. Now the whole of the slope is covered by the homes of a thriving, increasing and industrious population, while over the extending limits under the rule of the municipality, Learning looks down from the stately walls of Laval, and the members elected by your free and noble province will pass the laws, whose validity is guaranteed by our Federal constitution, in a Palace reminding one of the stately Fabric which holds the Art Treasures of France. None can observe the contrast without seeing that your progress, although it has partaken of no magic or mushroom-like growth, has been most marked and promising.

If commerce seeks for her abode the head of navigation there are many instances to show that she loves also to keep her ships to their native tides. An instance well known to us may be cited in the case of Glasgow and of Greenock, cities which have risen to their present prosperity so quickly that they rival in that respect many in America and in Canada. Greenock has not been killed by the enormous rise in the importance of the commercial capital of Scotland. Assuredly we may believe that Quebec, with a far greater country at its back, may be enabled, with the aid of proper communications, to pour forth every summer from her lap much of our wealth, of which Europe is so eager to partake.

These are the aspirations we share with you, and we wish to give effect to them by drawing the attention of those beyond the seas to the practical invitation you extend to them by the facilities afforded by your docks and wharves, and we now join with you in the trust that ample

repayment will be yours for the energy and engineering skill you have lavished on these public works, which are comparable to any designed for a similar purpose.

LORNE.

The drapery by which it had been concealed having been removed, the tablet stone was discovered, suspended over the place it was intended to occupy in the wall. The attendant masons having performed their part, a silver trowel was handed to the Princess. This was a handsome piece of workmanship, beautifully chased and set in a rose-wood handle, and bore the following inscription :—" To H. R. H. Princess Louise, this trowel was presented by the contractors of the Quebec Harbour Works on the occasion of her laying the tablet stone of the Princess Louise Embankment and Docks, River St. Charles, Quebec, July 29, 1880." Her Royal Highness, with this splendid implement, dug right lustily into the cement, and having prepared the bed, drew back to allow the ponderous stone to be lowered thereinto. This done, a beautiful mallet of polished oak having been presented, the mass received two or three blows, and was then declared to be well and truly laid. The Viceregal party, almost immediately afterwards, regained the "Druid," which swiftly conveyed the members thereof, to *terra firma*, the police yacht "Dolphin" being in attendance. Of the other steamers, the "Clyde" and "North," after a short sail round the harbour, landed their passengers at the Grand Trunk Railway wharf; the "Brothers," went down to St. Joseph, and gave to those on board an opportunity of noticing the progress made upon the new Graving Dock there. The troops and privileged guests having been conveyed to and from the scene by the Montreal Harbour Commissioners' boat "John Young."

SUMMARY OF PROGRESS.

HARBOUR IMPROVEMENTS, RIVER ST. CHARLES.

A continuation of the Harbour Improvement work was only resumed on the 15th of May of this year, notwithstanding that the contractors' entire plant had been wintered under the protection of the works in progress, an advantage not available in 1878. Nearly the whole of the temporary protection thrown up had been carried away by the high flood tides at the close of the severe winter season then past, doing some slight damage at the end of the unfinished masonry. During this time the permanent works maintained their form throughout, proved by the fact that the levels recorded last year on the coping then laid, and also on the 13th course at the end of the masonry, showed no appreciable change by instrumental observation.

The progress made with the masonry, was during this season more rapid and satisfactory, the Tidal Harbour Quay Wall having been completed to coping level by the 1st July for a length of 1,200 feet. A space having been reserved in the centre of this length for the "tablet stone," "LOUISE," this was duly laid by Her Royal Highness the Princess Louise in commemoration of her gracious consent to the Embankment and Docks being styled "The Princess Louise Embankment and Docks."

From this date, the 29th July, the masonry has been completed to coping level for a length of 1,200 feet of the quay wall of the proposed Wet Dock and has been backed up for an average width of 30 feet. The piling and sinking of

the caissons forming the substructure of this wall have been completed, including the concrete filling to the contract end of the work, not a single obstruction to the driving of the piles having occurred by boulders throughout the entire length of 2,230 feet.

The dredging of the 10 feet channel of the upper reach or Wet Dock portion of the work and the 24 feet channel of the Tidal Basin, preliminary works included in this contract, have been completed for final finishing up; and the dredging of the Tidal Basin, as included in the supplementary particulars, of the second or supplementary tender, included in this contract, in all 250,000 cubic yards, have been excavated, less a balance of 75,000 cubic yards; this, with the material already carried into the works, will be sufficient to complete the banking-in of the northern cribwork and quay walls for an average width of 30 feet, in each instance.

Supplementing this brief summary of progress with a statement of what is yet to be done, it will be sufficient to state that this initial work or contract will in all probability be brought to a successful conclusion by the end of the present year.

Profiting by the experience of the winter season of 1879-80, the raking end of the unfinished masonry, has this season been left wholly unencumbered and exposed to the full action of the frost and ice, with the known strength of the material employed, the result is looked forward to, as a crucial one, with the utmost confidence.

It may be well to mention that the adoption of masonry for the upper portion of the quay walls, was an alternative method, but an after thought so far, as the original designs were concerned. These shewed a front casing of timber with concrete filling from foundation to coping. The lower cribwork caissons of the main work ending as now at a level of 4 feet above average low water mark Spring

tides. This was obviously the best point for the "after thought" masonry to commence. Low water in the St. Lawrence during the Spring of the year at Quebec from sundry causes, "freshets," wind and ice, being from 2 to 3 feet higher than it is in July and August, a masonry superstructure at a lower level than that selected could hardly have been attempted without the aid of a cofferdam, or, without time, and cost, as objects primarily in view, being set aside. Practically in fresh water, with the known fact that timber in such a position is almost imperishable—an improved appearance of the wall in elevation at dead low water, a time at which the work is only exceptionally seen, would have formed the sum total of the benefit thus derived.

The final equipment and completion of these works is a consummation in the interest of the Port of Quebec devoutly to be wished, one of the necessary useful results by their inception and progress being now apparent in the protection already given to a large number of sailing craft and steamers of various tonnage which were unable, owing to the sudden setting in of the present winter season, to obtain shelter as usual, elsewhere. During last season protection was afforded to only two schooners and some floating stages; this season more than 12 vessels and steamers, together with the floating pontoons and depot of the Grand Trunk Railway, are safely wintered.

According to contract this section of the works as originally initiated was to have been completed by the 1st of October, 1880, but the contractors have asked extension of time which is now under consideration. The work so far executed has therefore fallen short of the complement expected by 1,000 feet of the superstructure of the Wet Dock, quay wall and the 425 feet of pitched inside slope of the shore junction at the Gas works wharf, together with 75,000 yards of the supplementary dredging in the Tidal Basin

and the complete banking in and finishing of the northern Crib-work and Wet Dock quay wall. If, however, the maximum result anticipated has not been attained, what has already been done leaves no ground for apprehension but that the future returns on the completed works will be a great public benefit, recompensating all the trouble and anxiety that have been lavished upon them, and returning in their ultimate value, as real estate, the cost of construction.

It is confidently asserted that a vote will be taken, or leave will be given, to appropriate a sum to cover the requirements during the coming fiscal year, of a further contract for completing the cross wall and travelling caisson entrance of the Wet Dock, plans and specifications for which have already been prepared by Messrs. Kinipple and Morris, M. M. I. C. E.

GRAVING DOCK WORKS ST. JOSEPH DE LEVIS.

The Graving Dock has also been subject in its measure to retardation as to progress owing to the tides in the spring and early summer not falling within some two or three feet of low water mark, ordinary spring tides. The commencement of the masonry of the entrance works was thus delayed for a considerable time, and it was not until Monday, the 7th of June, when His Excellency the Governor-General, the Marquis of Lorne, graciously laid the first stone of the wing wall that the water became low enough to bed the masonry of the superstructure.

Since then, however, at times encountering considerable difficulty from the force of wind and water in such an exposed position in a tide-way, the work has slowly but steadily proceeded. Both the wing walls east and west have now been brought to coping level and the bollards fixed in position. The retaining wall between the Government property and Mr. James Patton's mills on the east

has also been brought to coping level and the coffer-dam finished according to plans and specifications. The excavation of the upper half section of the dock pit, out of which 30,000 cubic yards have been removed, is the only other work at present proceeding on the dock site. The whole of the stone comprised in the inner masonry of the dock proper has now been cut and the greater part delivered on the site of the works from the quarries of St. Vincent de Paul. The work still to be done includes the balance of the excavation, masonry and concreting of the dock proper, together with the engine house, pump, wells and culverts of the builders' contract.

The travelling caisson for closing the dock with the hauling gear, has arrived from England and has been placed under shedding for storage during the winter months. This will require to be put together on the finished portions of the Dock floor available for this purpose next year at the cost of the commissioners.

The pumping machinery, the first sections of which, viz., the auxiliary engine and drainage pumps, are now provisionally complete, has been let by contract to Messrs. Carrier, Lainé & Co., of Point Lévis, comprising further, the main engines, gearing and main pumps, sluices, &c., the whole of which subject to test has to be completely finished and fixed in the works.

The character of this work is exceptional, it being the first of the kind in the Dominion of Canada, and the difficulties connected with and indeed inseparable from it, particularly with the outer walls and entrance, must be met and overcome, by that fearless struggle which must always ensue, when the requirements of men are in conflict with the forces of nature.

The President of the Institution of Civil Engineers, London, thus favorably alludes to the value and importance of the Works in progress, in the Annual Address, on taking

the Chair for the first time, January 11th, 1881. Page 17, paragraph 5 :—"In our Colony of Canada extensive improvements are in progress. At the City of Quebec a Tidal Harbour of 20 acres is being made, entering from the St. Lawrence River, with a depth of 24 feet at low water, together with a Dock of 40 acres, having a permanent depth of 27 feet, a most valuable terminus to the Railways, as it will enable goods to be shipped direct from the wagons into the vessels, instead of being conveyed by lighters to the shipping in the River."

RIVER ST. LAWRENCE.

HARBOUR OF QUEBEC—GRAVING DOCK.—LÉVIS.

By the Act 38 Vic., chap. 56, the Quebec Harbour Commissioners were authorized to borrow an amount which, with the sums voted by the Parliament of Canada or granted by the Imperial Government, were to be applied to construct a Graving Dock in the harbour of Quebec.

The location, by Order in Council dated May, 1877, was established at St. Joseph de Lévis.

The dimensions of the dock are :—

Length.....	500 feet.
Extreme width.....	100 "
Depth.....	25-5 "
Width of entrance.....	62 "

On Designs and Specifications prepared by Messrs. Kinipple & Morris, Engineers, Westminster and Greenock.

ESTIMATE AND EXPENDITURE.

Report on the Graving Dock Works at St. Joseph de Lévis, Quebec, from the Annual Report of the Minister of Public Works, Ottawa :—

RESIDENT ENGINEER'S OFFICE,
QUEBEC HARBOUR IMPROVEMENTS,
6th October, 1880.

In reply to the instructions, by abstract, from the letter of the Hon. the Minister of Public Works, dated Ottawa, September 16th, 1880, I have to report as follows :—

The Graving Dock at St. Joseph de Lévis, Parish of Lauzon, Quebec, was commenced by the Quebec Harbour Commissioners, under the Resident Engineer, Woodford Pilkington, M.I., C.E., in November, 1877, and was carried on previous to tenders being invited for the present contract, to the month of March, 1878, during which time the sum of \$6,298.20 was expended in excavation on the site of the Dock, which work was afterwards taken over by Messrs. Larkin, Connolly & Co., as an executed part of their contract, signed August 17th, 1878, and the above sum deducted from the contract amount of their tender for excavations given in the Bills of quantities under this head; the Harbour Commissioners being afterwards re-credited with this amount of expenditure under the first certificate.

The work of excavating for, and building this graving dock, was taken in hand under contract with the Quebec Harbour Commissioners, by Messrs. Larkin, Connolly & Co., on the 17th August, 1878, for a lump sum of \$330,953.89. The works to be delivered over to the Quebec Harbour Commissioners, finished complete, on the 1st day of June, 1882.

The first payment was made to the contractors on the 30th October, 1878, on which date the sum of \$2,701.80 was paid them for excavation, after having deducted the amount of work done by the Resident Engineer, making a total expenditure to that date of \$9,000, after deducting and retaining ten per cent as per contract.

The next payment made was the sum of \$9,000; \$2,564 of this being for rock excavating; \$3,400 on account of materials received on the lands of the Harbour Commissioners for the construction of the graving dock; and the balance, of \$3,986, was a payment on account for the construction of a road to the site of the graving dock and Government wharf as an item extra to the contract, and apart from it, making a total payment by the Harbour Commissioners to the 30th June, 1879, of \$18,000.

— 1879-80 —

Progress during the year commencing July, 1st, 1879, and ending June 30th, 1880.

The works have not progressed as rapidly as was expected. This can be accounted for in great measure by the tides in the spring and early summer not falling within some feet of low water mark, ordinary spring tides.

The commencement of the entrance works was thus delayed for a considerable time, and it was not until Monday, the 7th June, when His Excellency the Governor-General the Marquis of Lorne, graciously laid the first stone of the wing wall, that the water became low enough to bed the masonry of the superstructure.

Thus, the inner work of excavating and building depending on the completion of the wing walls and coffer dam, both of which had to be constructed by tide work, became also delayed.

During this fiscal year there has been employed on the works during the working months an average force of 125 men on the different pay-lists of the contractors, including the limestone quarries of St. Vincent de Paul and the granite quarries of Murray Bay.

The amount of advance made to Messrs. Larkin, Connolly & Co., under certificate for work done, labor, materials, &c., under contract with the Harbour Commissioners of Quebec, from July 1st, 1879, to June 30th, 1880, inclusive, amounted to \$45,653.94, less 10 per cent retained, or \$41,088.55 nett, making with the \$18,000, amount of previous advance, a total of \$59,088.55 to the end of this fiscal year.

Progress of Works to June 30th, 1880.

Both the wing walls of the dock entrance works were complete to the line of the outer apron, 30 feet from the caisson recess, and banked up with suitable material from the excavation to a foot nearly below coping level.

The retaining wall between the Government property and Mr. Patton's mill on the East, now under construction, will be completed before the end of the season.

The coffer dam is finished all but a few closing and key piles. clay puddle and back strutting, and awaits the completion and setting of the above mentioned retaining wall to shut out the water from the works as effectively as possible, the drainage and leakage being subject to discharge by pumping in the ordinary way.

The excavation of the dock pit of which 30,000 cubic yards, out of a total of 50,000 cubic yards, have up to this time been removed, is the only work at present proceeding on the Dock site.

The stone cutting for the graving dock has been continued steadily at the quarries of St. Vincent de Paul, about 95 per cent of the whole being now ready, 45,000 superficial feet having been delivered by the North Shore Railway, and the balance in transit or piled for transport.

Thus, with the completion of the excavation now in part down to grade, and of the arterial drains and lower concrete, the building of the dock, it is believed, will be carried on with successful expedition.

Since the termination of the fiscal year, there has been advanced to these contractors on certificate, a sum of.....\$ 43,174 59
 Less 10 per cent retained..... 4,317 45
 \$ 38,857 14

On masonry, wing walls, concrete, coffee dams and bollards fixed, forming a total advance of.....\$108,728 53
 Less 10 per cent retained..... 10,872 45
 \$ 97,856 08

Deducting then from this amount a sum of \$6,180 gives a sum of \$91,676.08 in remainder, being the total expenditure to the present date on the dock works, including advances on materials on the ground.

The work still to be done includes the balance of excavation, masonry and concreting of the dock proper, together with the engine house, pump wells and culverts, representing the equivalent unappropriated amount of the lump sum of \$239,277.81.

The travelling caisson for closing the dock has arrived from England, the work in all its details having been undertaken by Messrs. Richardson & Co., of Newcastle, at \$29,221.50. This will require to be put together on the finished portion of the dock floor available for this purpose, next year, at the cost of the Commissioners.

With regard to the pumping machinery, the first section of which, viz: the auxiliary engine and drainage pump, are well in hand; the entire machinery, comprising also the engines, gearing and main pumps, sluice valves, &c.,

have been let by contract, to be erected, finished complete, to Messrs. Carrier, Lainé & Co., of Point Levis, Quebec, for a sum of \$32,000, none of which has as yet been drawn on account.

I have the honor to be, Sir,

Your obedient Servant,

WOODFORD PILKINGTON, M. I. C. E.,
Resident Engineer.

To A. H. VERRET, Esq.,
Secretary-Treasurer.

Report on the Harbour Extension and Dock Works, in the River St. Charles, Quebec, now named "The Princess Louise Embankment and Docks":—

RESIDENT ENGINEER'S OFFICE,
QUEBEC HARBOUR IMPROVEMENTS,
12th October, 1880.

SIR,—Following the instructions conveyed to me, by abstract, from the letter of the Hon. the Minister of Public Works, dated Ottawa, September 16th, 1880, I have to report as follows in statement of the progress made from the commencement of these works, viz: From the 2nd of May, 1877, to June 30th, 1879, and from July 1st, 1879, to June 30th, 1880, the end of the last fiscal year, together with a statement of work yet required to be done to complete this contract, and lastly a statement of the proximate cost of the works in the section now in progress.

The schedules of explanatory synopsis, showing the details of expenditure, under the contract for each of the above named periods, with details of proximate cost form two annexures to this report, marked A and B.

These works were twice tendered for, the tenders first received not having been considered satisfactory, for se-

veral reasons; and it appears to me needful briefly to revert to this and the circumstances therewith connected, in order to explain fully the nature of this contract in relation to the work done, the amount of expenditure to date and the proximate estimate of cost of works, now constructed, when completed.

The tenders first received were for a lump sum, subject to deduction or addition for work not done, or for extra work that might be imposed "pro rata" to the extent of 10 per cent,

But the Harbour Commissioners were to find the ballast and stone filling, a sufficiency of which, for these purposes, having been supposed to arrive and be wasted yearly in the "ballast ground," as it is termed, of the St. Lawrence. This was considered a dangerous binding condition and, for one reason, necessitated the calling for fresh tenders. The second reason was that the quantity of dredging proposed was insufficient to enable the works themselves to be banked up, and further to enable large sized vessels "to reeve" into the channel space allotted for these purposes along the quay walls.

For these purposes, 250,000 yards of extra dredging were called for, to form part of the supplementary tender at a price per cubic yard for excavating and depositing in the works, and a schedule of prices at which the contractors would engage to supply ballast and stone filling for concrete and backing, in the event of the Commissioners being unable to supply these materials as aforesaid.

These two items alone made an increase in the work to be done by the contractors under the final tender of \$62,500 for dredging, and a contingent open amount of \$40,000 approximately for materials to be supplied as aggregates for concretes, clay and stone filling, backing, etc. Thus the contract became subjected to increase on these two items by a sum of \$102,500.

Besides this, during the progress of the works, it was deemed advisable, in order to accommodate the trade of the port, and in the interest of the smaller craft not so free to use the inside works, and also for the improvement of the work itself to construct the northern face of the proposed embankment in close faced crib-work to coping level. This addition was accepted by the contractors as an independent extra contract, subject in all respects to the conditions of the original, subject to the deductions on the stone pitching for labor only, and imposed a further outside extra of \$50,995.68.

The ultimate proximate cost of works became thus increased by a total sum of \$153,495.68.

The construction of this latter work was an exceedingly wise addition to the permanent works, and was undertaken at a time when the market price of materials was so low that a profit might be now realized, if in order for sale, on the materials alone thus employed. It becomes, then, properly noticeable at this point, that the amount of expenditure at this time is not in the ratio of the bulk sum of \$529,296.31 of the tender originally received for certain work, labor and materials, particularly mentioned in the bills of quantities, but of a sum greater than that by reason of the aforesaid additions, viz: \$682,791.99.

The expenditure to date appearing thus in the former case "pro rata" excessive, in the latter just and legitimate.

During the first year the contractors, Messrs. Peters, Moore & Wright were able only to sink the crib-work specified in the outer face as far as the east and west salient angles, to cut off at low water the south channel of the River St. Charles from the main stream, the ebb tide still passing from the upper reaches of the river across the site of the works and further commence the construction of suitable plant; the sum of \$52,698.13 having been certified to and paid the contractors, less 10 per cent retained.

In the second season, to the end of the fiscal year terminating June 30th, 1879, a further sum of \$166,626.90 was certified to and paid, less 10 per cent, making a total of \$220,325.03, less 10 per cent.

During the fiscal year from July 1st, 1879, to June 30th, 1880, a sum of \$239,902.03 was paid on certificate, less 10 per cent, making a total of \$450,267.33, less 10 per cent, or \$405,240.66 nett.

For the quarter just ended of the current fiscal year *i.e.* for the months of July, August and September, a sum of \$61,747.28, less 10 per cent retained, has been paid to the contractors, making a total to date of \$512,014.61, less 10 per cent, or a nett sum of \$460,813.22.

The balance of work, then, still to be done, according to the proximate estimate from the contract rates of the lump sum and supplementary schedules is in amount the difference between \$682,791.99 and \$511,974.34, or the sum of \$170,817.65. The quantities representing the approximate cost of the works are shewn in column No. 4 of the synopsis annexures A, B, as forming a possible total of \$673,459.16, and the quantity of work still to be done on this basis would amount to \$161,485.82.

The contract time for completion of this section of the works, expired on the 2nd October, 1880. No extension of time has as yet been granted, but the contractors have put in a request for an extension of time, shewing cause. This point has been referred to the engineers. As the works stand, it is in my view impossible to complete them before the end of the fiscal year ending June 30th, 1881, at earliest.

I have the honor to be, Sir,

Your obedient Servant,

(Signed,) WOODFORD PILKINGTON, M. I. C. E.,

Resident Engineer.

To A. H. VERRET, Esq.,
Secretary-Treasurer.

QUEBEC HARBOUR IMPROVEMENTS. — (Annexes A & B inclusive.)

Summary of work done from the 2nd May, 1877, to the end of the Fiscal Year ending 30th June, 1880.

Nature of Works.	From 2nd May, 1877, to 30th June, 1879.		From 30th June, 1879, to 30th June, 1880.		Required to complete Contract.		Approximate cost of Works.	
	Quantities.	Amount.	Quantities.	Amount.	Quantities.	Amount.	Quantities.	Amount.
<i>Dredging.</i>								
In Tidal Harbour Channel.....	126777 C.yds	\$ 31601 25	20268 C.yds	\$ 5067 00	29255 C.yds	\$ 738 75	150000 C.yds	\$ 37500 00
do Trench.....	90280 do	20792 40	do	do	10270 do	2422 10	100650 do	33214 50
In Wet Dock Channel.....	31096 do	6219 20	88660 do	17752 00	50214 do	10048 80	17000 do	3000 00
In Tidal Basin, Supplementary Particulars.	52780 do	13195 00	34475 do	8618 75	6133 do	1548 75	95130 do	23532 33
For Northern Crib-work.....	11573 do	3643 25	85000 do	22000 00	14727 do	26836 75	20000 do	62000 00
	2932 do	731 25	do	do	do	do	do	731 25
<i>Northern Crib-work.</i>								
Sub-structure.....	798 L. ft.	4128 04	do	do	do	do	do	4128 04
do do	950 do	9533 83	do	do	do	do	do	9533 83
do do	3090 do	16033 45	do	do	do	do	do	16033 45
do do	45300 C. ft.	9116 75	3440 L. ft.	41878 91	do	do	do	50995 68
Tidal Harbour Crib Blocks.....	120 L. ft.	1787 92	do	do	do	do	do	1787 92
Wet Docks	31 No.	40364 11	do	do	do	do	do	40364 11
Masonry.....	3792 C. ft.	2221 20	45390 C. ft.	27297 60	25 No.	17329 30	do	39444 90
	do	do	do	do	84793 C. ft.	50675 96	133391 C. ft.	80394 76
<i>Concrete.</i>								
Tidal Harbour Blocks 8 to 1.....	6975 C.yds	33131 25	do	do	do	do	do	33131 25
do do 4 to 1.....	3379 do	21118 75	do	do	do	do	do	21118 75
South Wet Docks do 8 to 1.....	do	do	do	do	do	do	do	3550 00
In masonry backing do 4 to 1.....	do	do	4178 C.yds	19703 00	3332 C.yds	15827 00	7480 C.yds	15468 73
Concrete in foundations, South Wet Docks.	16 to 1.....	1335 C.yds	3190 do	8578 12	1103 do	6800 63	2475 do	51751 25
Extra concrete.....	do	do	2036 do	13152 00	6370 do	30258 05	10899 do	do
Extra piling.....	do	do	814 do	6168 30	1772 do	5317 50	3825 do	11185 80
	do	do	do	3860 50	do	do	do	3860 50
	do	do	do	624 63	do	do	do	624 63

Extra concrete.....	2036	do	6168 30	17723	do	5317 50	38284	do	51731 25
Extra piling.....	814	do	3866 50	do	do	do	do	do	11485 80
			624 63						3866 50
									624 63

Bollards.....										2746 84
Preparing foundations, South Tidal Harbour.										1360 80
Preparing foundations, South Wet Harbour.										1989 00
<i>Stone.</i>										
Facing to Northern Crib-work.....	1535	Tons.								614 00
Backing to Tidal Harbour Block.....	128244	do	614 00							5564 20
In concrete	8556	do	5129 80							3342 40
Backing to Wet Dock Blocks.....			3342 40							5470 80
In concrete Wet Dock Blocks.....										4000 00
In extra concrete.....										46 40
do backing.....										41 09
<i>Clay.</i>										
Backing Tidal Harbour.....	7554	28								1976 32
do Wet Dock.....			1883 37							709 00
<i>Harding Materials.</i>										
Stone toeing.....										246 10
do in Tidal Harbour.....	2461	Cyds	246 10							1571 10
do in Wet Dock.....	1571	do	1571 10							3334 40
Contingent Fund.....										3858 99
<i>Miscellaneous Items.</i>										
In forming roadway.....										8829 80
Toeing to Tidal Harbour wall.....										161 00
<i>Ladders.</i>										
No. 4 in Tidal Harbour.....										94 12
No. 8 in Wet Dock.....										198 40
Pitching slope.....										340 50
Stone for roadway, etc.....										20000 00
Totals.....			\$43209 65							\$673459 16

Certified.

(Signed.)

WOODFORD PILKINGTON, M.I.C.E.,

Resident Engineer.

